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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,774	10/24/2003	Heon Lee	200209628-1	8966

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FORT COLLINS, CO 80527-2400

EXAMINER

TOLEDO, FERNANDO L

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/692,774

Applicant(s)

LEE, HEON

Examiner

Fernando L. Toledo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 7 – 20 in the reply filed on 28 March 2005 is acknowledged.
2. Claims 1 – 6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 28 March 2005.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 7, 10 – 12 and 15 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al. (U. S. Patent 6,806,096 B1).

In re claim 7, Kim, in the U. S. Patent 6,806,096 B1; figures 1 – 16 and related text, discloses a discrete magnetic tunnel junction stack including a top portion, a bottom portion, and a side portion; and etch stop layer 126 of a first electrically conductive material, the etch stop layer is in contact with the top portion; a bottom conductor 120 in electrical communication with the bottom portion; and a dual damascene conductor 158 including a top conductor and a via, the

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via is in contact with the etch stop layer, and the top conductor and the via are homogenously formed with each other (Column 8, Lines 47 – 51).

5. In re claim 10, Kim discloses several of the magnetic tunnel devices positioned in several rows and several columns of an array (Column 1, Lines 51 – 55); several of row conductors that are aligned with a row direction of the array (Column 1, Lines 51 – 55); and several of column conductors that are aligned with a column direction array (Column 1, Lines 51 – 55), each of the several of the magnetic tunnel junction devices is positioned between an intersection of one of the row conductors with one of the column conductors (Column 1, Lines 51 – 55), wherein the several row conductors includes a selected dual damascene conductor 158 or the bottom conductor 120 and wherein the several column conductor includes a selected one of the dual damascene conductor 158 or the bottom conductor 120.

6. In re claim 11, Kim discloses wherein the array is a MRAM array (Title).

7. In re claim 12, Kim discloses a discrete magnetic tunnel junction stack including a several thin film layers 124 that include a data layer, a reference layer, and a tunnel barrier layer positioned between the data layer and the reference layer (Column 5, Lines 54 – 59); the several thin film layers including a top portion, a bottom portion, and a side portion (Figure 3); an etch stop layer 126 of a first electrically conductive material, the etch stop layer is in contact with the top portion (Figure 3); a bottom conductor 120 in electrical communication with the bottom portion (Figure 3); and a dual-damascene conductor 158 including a top conductor and a via, the via is in contact with the etch stop layer, and the top conductor and the via are homogeneously formed with each other (Column 8, Lines 47 – 51).

8. In re claim 15, Kim discloses wherein the data layer is positioned at the top portion and the data layer is in contact with the etch stop layer (Column 5, Lines 54 – 59).

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9. In re claim 16, Kim discloses wherein the reference layer is positioned at the top portion and the reference layer is in contact with the etch stop layer (Column 5, Lines 54 – 59).

10. In re claim 17, Kim discloses wherein the tunnel barrier layer is made from a dielectric material (Column 5, Lines 54 – 59).

11. In re claim 18, Kim discloses several of the magnetic tunnel devices positioned in several rows and several columns of an array (Column 1, Lines 51 – 55); several of row conductors that are aligned with a row direction of the array (Column 1, Lines 51 – 55); and several of column conductors that are aligned with a column direction array (Column 1, Lines 51 – 55), each of the several of the magnetic tunnel junction devices is positioned between an intersection of one of the row conductors with one of the column conductors (Column 1, Lines 51 – 55), wherein the several row conductors includes a selected dual damascene conductor 158 or the bottom conductor 120 and wherein the several column conductor includes a selected one of the dual damascene conductor 158 or the bottom conductor 120.

12. In re claim 19, Kim discloses wherein the array is a MRAM array (Title).

13. In re claim 20, Kim discloses wherein the tunnel barrier layer is made from a dielectric material (Column 5, Lines 54 – 59).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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15. Claims 8, 9, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim as applied to claims 7, 10 – 12 and 15 – 20 above, and further in view of Zhu et al. (U. S. Patent 5,838,608A).

In re claims 8 and 13, Kim discloses wherein the first material of the etch stop layer is electrically conductive material (Column 6, Lines 3 – 5).

Kim does not disclose wherein the electrically conductive material is aluminum. However, Zhu, in the U. S. Patent 5,838,608 A discloses that MRAM devices have conductive layers that can be made of aluminum, copper or alloys (Column 4, Lines 22 – 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the electrically conductive material of Kim made out of aluminum, since as taught by Zhu, MRAM devices can be made of aluminum, since it has been held to be within the general skill of a worker in the art to select a known material on the base of its suitability, for its intended use involves only ordinary skill in the art.

16. In re claims 9 and 14, Kim discloses wherein the dual damascene conductor is made of a conductive material.

Kim does not disclose wherein the conductive material is aluminum, alloys of aluminum, tungsten, alloys of tungsten, copper and alloys of copper. However, Zhu, in the U. S. Patent 5,838,608 A discloses that MRAM devices have conductive layers that can be made of aluminum, copper or alloys (Column 4, Lines 22 – 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the electrically conductive material of Kim made out of aluminum, since as taught by Zhu, MRAM devices can be made of aluminum, since it has been held to be within the

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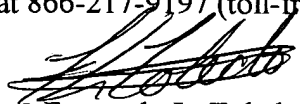
general skill of a worker in the art to select a known material on the base of its suitability, for its intended use involves only ordinary skill in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-1867. The examiner can normally be reached on Mon-Thu 7am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Fernando L. Toledo
Examiner
Art Unit 2823

flt
9 June 2005